

► MLS (Microwave Limb Sounder)

- **Technique:** Microwave emission (3 radiometers, 63 GHz, 183 GHz, 204 GHz)
- **Data timespan:** Fall 1991 to Summer 2001 (last turn-on); best coverage is prior to 1995 (instrument scanning and satellite problems after this).
- **Data Coverage, Resolution:** Coverage -34° to 80° or -80° to 34° , because of 36 day “yaw periods”; 1317 profiles/day (day & night) [if continuous operation]. Resolution: vert. $\sim 3 - 5$ km, horiz. FOV width ~ 7 km, LOS smearing ~ 250 km.
- **Data Products:**
 - > No strat. H₂O data after mid-April 1993 [failure of 183 GHz radiometer]
 - > No Temp. data after June 1997 [power sharing, no more 63 GHz radiometer data]
 - > Since June 1997:
 - Stratospheric O₃, ClO, HNO₃ (accuracy $\sim 6\%$, 15% , $10 - 30\%$)
 - Upper Tropospheric Humidity (UTH) [~ 460 to 150 hPa] (accuracy $\sim 20 - 30\%$)
 - Also, CH₃CN (zonal mean) data (accuracy - not validated); volcanically enhanced SO₂ is also retrievable.
 - UARS MLS could be activated for Aura validation in 2004, but with uncertain and spotty data coverage (UARS power sharing) [assuming instrument performs well].

► HALOE (Halogen Occultation Experiment)

- **Technique:** Solar occultation in IR (wideband and gas correlation channels) gives upper atmospheric profiles at the terminator (sunset and sunrise).
- **Data timespan:** Fall 1991 to now; no problems, expect very good data for Aura validation.
- **Data Coverage, Resolution:** Sweep slowly from -80° to 80° (over a month).
15 sunsets and 15 sunrises/day (each in a narrow latitude band).
Vertical resolution ~ 1.6 km.
- **Data Products and Vertical Ranges (accuracies are typically ~ 5 to 15%):**
 - O_3 : tropopause to ~ 90 km
 - H_2O : tropopause to ~ 80 km
 - HCl : tropopause to ~ 60 km
 - HF : tropopause to ~ 60 km
 - CH_4 : tropopause to ~ 80 km
 - NO : tropopause to ~ 130 km
 - NO_2 : tropopause to ~ 60 km
 - Temp: ~ 30 km to ~ 80 km
 - Aerosol extinction (4 channels, 2.5 to 5.3 μm): strat. + noctilucent clouds (~ 80 km)
- **Data availability:** Request from HALOE website (small files, with ~ 1 month delay).